Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

material of which organisms are composed, and to substitute for this the study of living forms as structures or systems. Such a view may or may not lead to an explanation in terms of the ordinary concepts of physical science. But if this further consequence is not realized, still to understand the actual functions in terms of the complex structure itself seems the only method of rendering intelligible the whole field of animal behavior. Jennings seems to have come to some such conclusion. On the other hand, the attempt before us progresses but little in the direction of elucidating the vital processes. The application of certain concepts, like equilibrium, change of position, inertia, etc., in the latter is only significant provided it really renders the activities more intelligible in the sense that it gives us insight on the basis of which further definite facts may be anticipated and sought, and is not a mere transference of terms. The latter seems to be the case here. To call growth an attempt to restore equilibrium is valid enough in a sense, but it adds nothing to our concrete grasp of the details of the situation. And such hypotheses are sterile.

Many less important details could be added to our criticism. The account of mind is of course quite inadequate and hence vague. Also the apparent advocacy of the inheritance of acquired characteristics is at present quite unwarranted. And the whole work fails to show how on the basis adopted the differences between organisms which can learn and systems which can not, *i. e.*, how the results achieved by the study of animal behavior such as those of Jennings, are to be accounted for. Unwarranted assumptions are also frequent.

ROBERTS B. OWEN.

COLUMBIA UNIVERSITY.

The Theory of Relativity. By L. SILBERSTEIN. Macmillan and Co., London, 1914.—pp. viii, 295.

This scholarly and carefully written book is intended as an introduction to the recent development of physics known as the theory of relativity. The author presupposes on the part of the reader advanced knowledge of mathematics, such as vector analysis, and a considerable acquaintance with such branches of physics as electro-dynamics, etc. It is thus primarily a book for mathematical physicists. If the philosopher, however, is willing to descend from his architectonic heights and become a humble learner from a modest but competent and conscientious investigator, he is likely to receive much illumination concerning the meaning of such prevalent ideas as the laws of nature, time, space and causality. It is not that the author, like some other expositors of the newer theory of relativity, enters the lists in the fight against traditional ideas of physics. Dr. Silberstein is not inclined to emphasize the revolutionary character of the new ideas, but is rather concerned to show their intimate connection with the older ones. But, in spite of the fact that he is not concerned with the traditional problems of the philosophy of nature, anyone who follows his careful analysis of the ideas involved in the classical mechanics and their modification suggested by recent experimental work must realize how vague and fanciful have been the classical philosophic data as to nature, motion, time, etc.

The first chapter is devoted to an exposition of the doctrine of relativity in the classical Newtonian mechanics. The dependence of the propositions which we know as the laws of nature, not only on our spatial system of reference, but also on the character of our time measurer, is brought out very clearly. Thus the classical physics is not concerned with absolute space or time, but gives only "sets of *simultaneous* states of motion of the various bodies, the timekeeper itself being included" (p. 6). Very instructive, also, is the way in which the principle or maxim of causality is explained in connection with the choice of clocks. The first and most general assumption of all physical investigation is "that our differential equations, representing the laws of physical and other phenomena, *should not contain the time*, the variable t, *explicitly*" (page 7). Or in the words of Maxwell, "the difference between one event and another does not depend on the mere difference of the times." When the laws of a physical system cannot be so expressed, every physicist will first of all try to throw the disturbance on some external agent rather than on his clock. If we find nothing in the nearest neighborhood, we look for further and deeper factors, and if we do not find real supplementary factors around us, we introduce *fictitious* supplements which may "turn out to be real afterwards, thus leading to new discoveries." Thus, a heated sphere losing its heat at a constant rate will be an example of an undisturbed system, but if the loss of heat varies at different times, we would introduce external factors, such as oxidization, etc., rather than assume that our clock varied. Though we always prefer to retain our traditional clock, it is possible to reduce our laws to the desired simplicity by reforming our clock. Thus, to get rid of one of the inequalities of the motion of the moon around the earth, astronomers have had recourse to the supposition that there is an actual slackening in the speed of the earth's rotation due to the tides. Further researches may oblige us to give up the kinetic time of astronomy for a better one, for example, electromagnetic time. "Thus, in the struggle for *completeness* of our physical universe, we shall have always to balance the mathematical theory of one of its fragments, or sides, against that of another. A great help in this struggle is to us the circumstance that, though, rigorously, all parts of what is called the universe interact with one another, yet we are not obliged to treat at once the whole universe, but can isolate from it relatively simple parts of fragments, which behave sensibly as complete systems, or are easily converted into such" (pp. 14–15).

The laws of classical mechanics of Galileo and Newton have no unique frame of reference, since if the Newtonian equations of motion are invariant relative to any system of reference, they are also invariant relative to any other framework having a uniform velocity of translation with reference to the latter. Nineteenth century physics tried to make the ether into a unique system of reference and thus replace absolute space. But all optical and electromagnetic experiments to detect "motion relative to the aether" have failed. The new theory of relativity shows that they must necessarily fail.

Chapters two to four trace the development of electromagnetic theory from Maxwell to Lorentz, showing how the dis-substantialization of the ether and the introduction of the notion of 'local time' gave rise to the investigation of Einstein as to the meaning of simultaneous events in different systems and the modern principle of relativity. The uniqueness of the latter consists in questioning the usual assumption that our clock is valid for all points of space, and that we know without further definition what we mean by simultaneous events in different places. The precise laws which enable us to pass from the time of one system to that of another moving with reference to it are known as the Lorentz transformations, and serve as the basis of the new non-Newtonian mechanics and of all that is valid in Maxwell's electro-magnetics. The remainder of the book (chapters five to ten) is devoted to working this out in detail.

MORRIS R. COHEN.

COLLEGE OF THE CITY OF NEW YORK.

A History of Philosophy. By CLEMENT C. J. WEBB. New York, Henry Holt and Company; London, Williams and Norgate, n.d.—pp. 256.

This volume is No. 96 of the Home University Library. It covers the entire history of philosophy from Thales to the nineteenth century and accords at least a mention to nearly all the men whose names appear in the ordinary texts. To deal with such a subject matter in two hundred and fifty small pages calls for an extraordinary amount of compression, so much, in fact, that it is seriously questionable whether the result can justify the labor of the attempt. Some philosophical notables come off with a very scant treatment indeed. Hobbes, for example, receives only incidental mention chiefly in connection with Descartes, and Hume, aside from references in connection with Kant, is disposed of in two pages, less than is given to Heraclitus or Anaxagoras. Considering the requirements of the case, however, it is perhaps less surprising that the condensation has been violent than that it has not been more violent than it has. Whether even that part of the public which has the least interest in the technicalities of the subject can be expected to gain much understanding from an exposition so general, is another question. Since there are already a number of excellent short histories of philosophy in English, the need for the book is scarcely apparent. If the editors of the Library felt that completeness required them to furnish a history of philosophy, it would have been wiser to devote more than one volume to the subject, as they have done in the case of English political thought.

Assuming that the task had to be attempted in one volume, the author has done it well. The style is not only clear and free from technicalities, but is surprisingly lacking in unpleasant reminders of the condensation which the author has had to practice. If this effect is sometimes gained by devoting precious space to matters not strictly within the limits of philosophy, it is at least open to argument that a book of this kind gains more than it loses by this method. The interpretations follow, as might be expected, the traditional